

Air quality in schools affects cognitive performance

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(PhysOrg.com) -- Research by a team led by Professor Derek Clements-Croome at the University of Reading has shown a direct association between the environmental conditions in classrooms and pupils' cognitive performance.

The research, funded by the Engineering and Physical Sciences Research Council (EPSRC), found that the thermal and air quality conditions in classrooms was inadequate for teaching activities during about 35% of the school hours. The pupils and teachers in the classrooms studied were exposed to unacceptably poor air quality conditions, with CO_2 concentrations of up to 3.5 times the existing recommended average levels of 1500 ppm (Building Bulletin 101) and uncomfortable thermal conditions.

Professor Clements-Croome said : "Fresh air supply rates of 8 l/s per pupil are needed if the concentration of pupils is not to be impaired. Teachers need not only temperature monitors but also CO2 monitors to help them assess when to open windows or turn on the ventilation."

Professor Derek Clements-Croome ran tests at eight primaries. "We tested reaction times and memory of pupils. When the CO2 was very high, the reaction times would slow and memory would be affected. The kids would also get drowsier.

"A classroom doesn't have to be that small if you have 25 children and a teacher breathing in and out and the proper ventilation isn't there. You



may not even detect that it's getting stuffier in the room. But once higher CO2 levels are breathed in, it gets into the blood and goes to the brain.

"People are trying to get their energy consumption down, but that shouldn't be at any expense. There is no point pushing for energy reduction if kids are falling asleep."

The basic recommendations to the school personnel from the work are:

• Equip classrooms with a monitoring device for: CO2, temperature & relative humidity.

• Take immediate actions for additional ventilation if CO2 concentration exceeds 1000 ppm.

• Keep temperatures within comfortable range: between 20-22 °C (winter) and 22-24 °C (summer).

• Create daily window opening routines for the school: Morning, before children arrive, During breaks and after school hours during cleaning

- Use odourless cleaning agents.
- Remember that dirty carpets can pollute the indoor environment.

Provided by University of Reading

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